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The Impact Path of Executive Team Heterogeneity and Environmental-Social-Governance on Corporate Performance

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Abstract

Taking pharmaceutical manufacturing companies listed in Shanghai and Shenzhen A-share in 2021 as a sample, this paper explores the synergistic effects and driven paths of ESG and five dimensions of executive team heterogeneity on corporate performance by applying fuzzy-set Qualitative Comparative Analysis (fsQCA). This paper finds that: 1) A single factor is not necessary to drive corporate performance, and there is asymmetry in the impact of each antecedent condition on corporate performance; 2) There are three driven paths for high corporate performance: ESG-driven path, social interaction-driven path, and team conflict-driven path.

Keywords

ESG, Executive Team Heterogeneity, Corporate Performance, Fuzzy Set Qualitative Comparative Analysis

1. Introduction

Against the backdrop of green and sustainable development, governments and investors are placing more and more emphasis on ESG practice. *The Outline of the 14th Five-Year Plan and Vision 2035* emphasises that China "has entered a stage of high-quality development" and that to promote high-quality development, it must "implement the new development concept and build a new development pattern. ESG, short for environment, social and governance, is the practice of environmental protection, social responsibility and corporate governance based on the concept of sustainable development. ESG is also the manifestation of the new development concept at the corporate level, and it is an important channel of high-quality development. In recent years, more and more corporates have paid attention to ESG practice and incorporated it into their strategies.

By combining domestic and international studies, it is found that: the economic consequences of ESG are mainly focused on corporate performance and corporate value. Based on stakeholder theory, ESG helps corporates establish good social reputation, reflects the positive response to the needs of stakeholders, and expands financing channels (Li et al., 2021). Therefore, ESG can alleviate financial constraints and improve corporate performance and corporate value. However, there is a lack of research on the antecedents of ESG. CEOs and top management teams, as the makers of corporate strategies, have a significant impact on ESG practice. The cognitive differences arising from executive team heterogeneity will affect the formulation and implementation of ESG strategies. Nevertheless, the impact and mechanism of executive team heterogeneity on ESG have not been clarified and there is still a large gap. Therefore, in order to investigate the mechanism and driven path of high corporate performance, this paper adopts ESG and executive team heterogeneity as antecedent conditions by using fuzzy set Qualitative Comparative Analysis. This paper breaks through the linear assumptions of previous research on the relationship between ESG and corporate performance, exposes the mechanism of ESG, executive team heterogeneity on corporate performance, and enriches the research on the relationship between ESG, executive team heterogeneity on corporate performance. This paper provides theoretical reference for corporates to improve social benefits, achieve sustainable development. It has certain reference significance for the government to promote the realization of high-quality development goals of corporates.

This paper is organized as follow sections. The first section is introduction. This section points out the importance of ESG, and proposes that executive team heterogeneity can synergize and match with ESG to affect corporate performance. The second part reviews and sorts out literature, and expounds the impact of executive team heterogeneity and ESG on performance. Baes on this, this section constructs theoretical framework. We argue that the synergy between five dimensions of executive team heterogeneity and ESG can produce different configurations. In the third section, the paper describes research methodology, sample sources and antecedents and outcome variables. Since then, fsQCA3.0 has been used to conduct descriptive statistics, calibration, necessity analysis and sufficiency analysis. There are six high-performance configurations that are obtained. We summarize these six configurations into three driven paths. Finally, the paper concludes the findings and proposes recommendations for managers.

2. Literature Review and Theoretical Analysis

2.1. Executive Team Heterogeneity and Corporate Performance

Executive team heterogeneity refers to the degree of difference which executive team members differ in demographic characteristics such as age, gender, and nationality, as well as in the cognitive perceptions. It was proposed first by Hambrick et al. and they suggested that executive team heterogeneity allows executive teams to make differentiated decisions that have a significant impact on business operations (Hambrick & Mason, 1984). There were many studies that found different dimension of executive team heterogeneity have different effects on corporate performance. For example, Cultural heterogeneity improves strategic decision-making by enhancing information processing and creativity (Ponomareva et al., 2022); gender heterogeneity introduces a female perspective to corporate decision-making and thus improves the quality of financial reporting (Hrazdil et al., 2023); and occupational heterogeneity can create open and inclusive work environments and may improve innovation performance (Li & Xia, 2022).

We select five dimensions of executive team heterogeneity as antecedents in order to explore which configuration of executive team heterogeneity can affect performance. These five dimensions include age heterogeneity, gender heterogeneity, tenure heterogeneity social capital heterogeneity and occupational heterogeneity. The main reason why we choose these dimensions is that they can effectively reflect the differences in demographic characteristics and values of executive team. Besides, we argue that social capital is brought by educational background, academic experience, overseas experience, government experience, etc. As a result, to avoid multicollinearity, we do not select these dimensions repeatedly.

2.1.1. Age Heterogeneity and Corporate Performance

Differences in age lead to differences in risk perceptions, decision-making orientations and thinking patterns. If there are large differences in the age groups of Executive team members, young managers who want to achieve high risk-return and older managers who want to avoid risk can complement each other. Therefore, it can improve the quality of the institutional arrangement and avoid extreme risk preference and extreme risk aversion. Wen et al. found that age heterogeneity has a significant positive effect on corporate performance (Wen, Zeng, & Wang, 2019). Based on this, this paper selects age heterogeneity as one of the antecedents of corporate performance.

2.1.2. Gender Heterogeneity and Corporate Performance

Gender heterogeneity refers to differences in team members' gender. Chinese companies' Executive teams are predominantly male, and high gender heterogeneity indicates a high proportion of female executives. Compared with the aggressive and adventurous spirit of male executives, female executives have a stable management style. It can facilitate the enforcement of corporate governance, enhance the caliber of financial information disclosure, and elevate corporate performance (Hrazdil et al., 2023). According to feminist care ethics, female emphasis "care and responsibility", so corporates with more female executives tend to have better environmental benefits and social responsibility benefits.

2.1.3. Tenure Heterogeneity and Corporate Performance

The length of tenure reflects employees' recognition of the corporate, members' understanding of the corporate's cultural concepts and grasp of the corporate's operations (Wang, He, & Yang, 2022). Executives with longer tenure not only have deep understanding of the corporate culture, deep grasp of the corporate management mode and rich management experience, but also are able to cope with the many problems relying on their experience. However, it is easier for them to form stereotypes and take conservative measures when facing a complex and changing environment. That may result in missed development opportunities. On the contrary, although executives with shorter tenure do not have a good understanding of the firm, they have a more flexible management style and are more likely to generate novel ideas that can inject vitality into the corporate's operations. High tenure heterogeneous teams have more diversified experiences. And the communication within team is more fluent, which can effectively prevent short-sighted thinking. At the same time, they will also adjust the strategic decisions according to the changes of the external environment, and increase the resource investment in innovative behaviour (Zhang, Xiang, & Cao, 2018), which is conducive to improving corporate performance. Based on this, this paper incorporates tenure heterogeneity into the antecedent conditions that drive corporate performance.

2.1.4. Social Capital Heterogeneity and Corporate Performance

Qian and Han refer to the value created by the Executive team through building social networks as social capital (Qian & Han, 2008). According to resource-based theory, executives obtain scarce resources and information through their own social networks, thus helping the corporate to "integrate" into the social network (Chen, Wang, & Wang, 2021). In China, where emphasis is placed on interpersonal relationships and social networks, social relationships are deeply integrated with institutional culture. This compels corporates to integrate into social networks in order to expand their resources access. Management teams with diversified social capital are more likely to obtain the resources needed for corporate development through deep integration of social resources. On the contrary, social capital heterogeneity can facilitate enterprises in establishing connections with government, gaining access to formal networks, and acquiring government subsidies and preferential policies (Wu, Wood, & Khan, 2021). Therefore, this paper includes the social capital heterogeneity as one of the antecedent conditions in order to explore its synergy with other factors.

2.1.5. Occupational Heterogeneity and Corporate Performance

The occupational experience of executives can directly affect their cognition, and then influence their attitude towards things. High Occupational heterogeneity also means having broader social relationship resources, which can help corporates recruit talents and obtain resources. Thus, it may strengthen the competitive advantages, enhance the innovation performance and broaden product share (Lu et al., 2023). To sum up, high Occupational heterogeneity can improve performance Therefore, this paper selects Occupational heterogeneity as one of the factors of corporate performance.

In summary, this paper argues that the effect of Executive team heterogeneity on corporate performance is a complex causal relationship with asymmetry. This paper adopts five dimensions of top management heterogeneity—age, gender, tenure, social capital and occupational background, as antecedent conditions to explore their mechanism on corporate performance.

2.2. ESG and Corporate Performance

By combing the existing domestic and international literature, the study of ESG on corporate performance mainly focuses on alleviating financing constraints and strengthening stakeholder linkages.

Great ESG practice can promote the construction of human resources, alleviate principal-agent problems, and improve corporate reputation. Firstly, ESG can send good signals to the labour market, attracting high-quality talents and thus obtaining better human resources (Kang & Jaesin, 2021). In addition, corporates with great ESG performance have open promotion channels and a quality working environment. As a result, it can reduce employee laziness and improve their initiative and creativity. Secondly, Great ESG practices imply a systematic and complete management system. It is able to provide strong supervision to the Executive team and avoid executives from making self-interested behaviors that are detrimental to the corporate, thus alleviating principal-agent problems. Finally, companies with good ESG practice pay more attention to issues such as environmental protection and devote more resources to charitable activities. These behaviours convey to stakeholders the excellent brand image as a "public-spirited and responsible" corporate. This enhances corporate reputation, thus winning the favour of customers and retaining the market share.

Information conveyed by ESG can reduce the information asymmetry, deepen the understanding of investors about the operation of corporates, and thus alleviate the financing constraints (Zhang, Wang, & Dong, 2023). On the one hand, non-financial information reflected by good ESG practice shows the good operating conditions and prospects of the corporate, which helps investors and shareholders to understand the corporate more comprehensively (Broadstock et al., 2021). Besides, in China, great ESG practice implies that companies take on more social responsibility and contribute more to the achievement of the goal of common wealth (Nie, Lin, & Cui, 2022), which can strengthen political affiliation and gain government support in financing.

2.3. Theoretical Framework Construction

According to Upper Echelon Theory, managers' experience can shape their values and cognitive concepts (Carpenter, Geletkanycz, & Sanders, 2004), and executive team heterogeneity can deeply influence the perspective of executive team in viewing and solving problems. Thus it can indirectly affect corporate strategy and decision-making. Judging by Information Decision Theory, heterogeneity can complement in knowledge, information, ability and resources (Peng et al., 2022). Highly heterogeneous management teams have broader information channels, complementary knowledge and capabilities, and diversified thinking perspectives. They are able to make comprehensive analyses of decision-making. Besides, a highly heterogeneous team pays more attention to meeting demands of stakeholders, focuses on social and environmental responsibility and internal governance. Therefore, corporate can incorporate ESG into development strategy and promote performance. On the other hand, according to Social Approval Theory, individuals will categorize themselves and others through certain characteristics, and identify with members within the group they belong to, but reject others within other groups. Based on this psychology, management teams with high homogeneity have more open communication channels and a harmonious working atmosphere. It is able to reach a consensus on issues such as ESG.

In summary, this paper selects age heterogeneity, gender heterogeneity, tenure heterogeneity, social capital heterogeneity, occupational heterogeneity, and ESG as antecedent. This paper also adopts fuzzy set Qualitative Comparative Analysis to deeply explore the complex causal relationship of these antecedents on corporate performance, in order to reveal the driven path of high corporate performance. The theoretical framework is shown as **Figure 1**.

2.4. Summary

After sorting out previous research, we find that the research on the impact of executive team heterogeneity on performance is often based on the linear hypothesis. It is believed that the executive team heterogeneity has a positive or negative correlation impact on performance. Different dimensions of executive team heterogeneity will have different impacts on performance. It is also found that ESG can play a mediating role in the impact of executive team heterogeneity on performance. The research on the relationship between executive team heterogeneity,

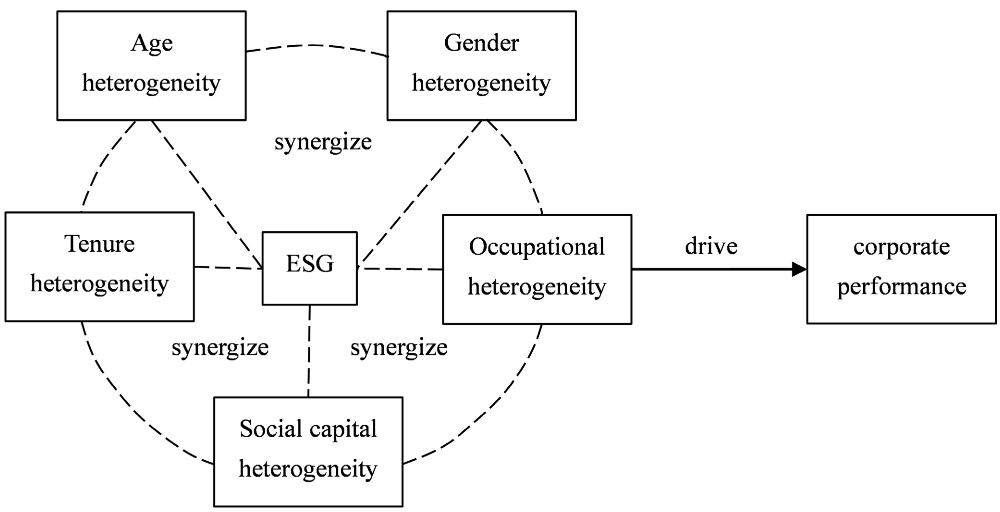

Figure 1. Theoretical framework.

ESG and performance is still in its infancy, and there are large gaps. Can different configurations of executive team heterogeneity improve corporate performance? Can different configurations of executive team heterogeneity and ESG influence performance in tandem? How can executive team heterogeneity and ESG configurations have a positive impact on performance? These questions are difficult to clarify on the basis of linear assumptions. Therefore, we use set theory and holism to explore the synergy and driven path of different dimensions of executive team heterogeneity and ESG on performance, so as to solve these problems.

3. Research Method and Data Description

3.1. Fuzzy Set Qualitative Comparative Analysis

Qualitative Comparative Analysis (QCA) is a research method that combines case study and quantitative analysis (Du & Jia, 2017). QCA assumes that complex groupings resulting from interdependencies and combinations of elements lead to outcomes. It compensates for both the shortcomings of empirical analysis which ignores individual cases, and the lack of data support for case analyses. Fuzzy set Qualitative Comparative Analysis (fsQCA) is an application of the QCA method, which compensates for clear sets. It allows cases to affirm the existence of partial affiliation by calibrating to take affiliations between 0 and 1. This paper explores the impact of ESG and Executive team heterogeneity on corporate performance through fsQCA. And it investigates which groupings of ESG and Executive team heterogeneity produce high corporate performance.

3.2. Source of Data

This paper selects pharmaceutical manufacturing corporates listed on A-share market in 2021 as samples, and excludes: 1) Corporates with missing background of Executive team members and less than three members of Executive team; 2) Corporates without disclosing ESG reports, and obtains a total of 121 pharmaceutical corporates as samples. This paper collects the background data of Executive team members and relevant financial data through CSMAR database, and measures ESG through ESG index measured by Sino-Securities Index Information Service Company Limited.

3.3. Variables

In this paper, the five dimensions of Executive team heterogeneity and ESG are selected as antecedent conditions, corporate performance is chosen as the outcome variable. ROA is used as the indicator of performance. Executive team heterogeneity includes five dimensions of age, gender, tenure, occupational background and social capital. They are calculated by using the Herfindahl index (Hambrick, 1981), which is calculated by the formula: $H = 1 - \sum_{i=1}^{n} P_i^2$. The formula Pi indicates the percentage of the total number of members of the Executive team attributed to category i, n is the total number of categories. The greater the value of H, the greater the degree of heterogeneity of the Executive team in this category. The definitions of variables are listed in Table 1.

4. Analysis

4.1. Description Analysis

Table 2 shows the descriptive statistics of antecedents and outcome variables. As can be seen from Table 2, difference between the maximum and minimum values of enterprise performance (ROA) is large, and the mean is greater than the median. This indicates that the performance of more than half of pharmaceutical

Table 1. List of variable definitions.

Variable type	variable code	variable name	Variable Measurement Methods
outcome variable	ROA	Corporate performance	Net profit/average balance of total assets
antecedent condition variable	Age	Age heterogeneity	The Executive team members were categorised by age, which was then calculated by Herfindahl coefficients
	Gen	gender heterogeneity	Calculated from Herfindahl coefficient
	Ten	Tenure heterogeneity	The Executive team members were categorised by tenure, which was then calculated by Herfindahl coefficients
	Ocu	Occupational heterogeneity	Calculated from Herfindahl coefficient
	Soc	Social capital heterogeneity	Calculated from Herfindahl coefficient
	ESG	ESG	ESG Index measured by Sino-Securities Index Information Service Company Limited.

Table 2. Descriptive statistical table of antecedents and outcome variables.

Variable	Min	Max	Mean	Mediam	SD	Number of observations
ROA	−0.191	0.35	0.053	0.051	0.079	121
Age	0.077	0.258	0.162	0.162	0.037	121
Gen	0	0.5	0.328	0.346	0.128	121
Ten	0.412	1.501	0.846	0.843	0.208	121
Soc	0.473	1	0.897	0.923	0.09	121
Ocu	0.311	0.934	0.675	0.694	0.13	121
ESG	55.45	84.96	71.95	71.86	6.103	121

enterprises is lower than the industry average. The variance of ESG is 6.103, indicating that there are large differences in ESG among different enterprises. The variance of executive team heterogeneity in each dimension is less than 1, which shows that executive team heterogeneity in all enterprises is similar. The gap between the mean and median of age heterogeneity and tenure heterogeneity is small. This reveals that age heterogeneity and tenure heterogeneity are more evenly distributed. The median of gender heterogeneity, social capital heterogeneity and occupational heterogeneity is greater than the mean, indicating that more than half of enterprises have gender heterogeneity, social capital heterogeneity and occupational heterogeneity exceeding the industry average.

4.2. Calibration

FsQCA requires calibration of each variable before constructing the truth table. Since the antecedents and outcome are continuous variables, the calibration requires setting three critical values: fully affiliated [1], fully unaffiliated [0], and crossover point [0.5]. Referring to the recommendations of Fiss (Fiss, 2007), the three critical points were set as upper quartile, mean and lower quartile, as shown in **Table 3**.

4.3. Necessity Analysis

Prior to the conditional analysis, it is necessary to figure out whether a single condition is necessary for performance. A consistency of 0.9 is used as a critical value, above which the factor is necessary to produce the results (Fiss, 2011).

Table 4 reports the results of the necessity test for each antecedent condition for high. As can be seen in **Table 4**, the consistency of all antecedent conditions is lower than 0.9 and the coverage is lower than 0.7, which indicates that all antecedent conditions have weak explanatory power for high performance, and are not necessary conditions for causing high performance. Therefore, all antecedent conditions should be included in the sufficiency analysis.

4.4. Sufficiency Analysis

In this study, fsQCA3.0 was used to perform a sufficiency analysis, and three

Table 3. Calibration of antecedents and outcome variables.

	Fully unaffiliated	Crossover point	Fully affiliation
Age	0.1405	0.162	0.185
Gen	0.236	0.346	0.431
Ten	0.7085	0.843	0.972
Soc	0.8675	0.923	0.951
Ocu	0.588	0.694	0.78
ESG	68.255	71.86	76.925
ROA	0.02	0.051	0.0865

kinds of solutions were obtained: the complex solution, the intermediate solution and the parsimonious solution. The intermediate solution adds logical residual terms, which can get more reasonable conclusions, so this paper selects the intermediate solution as result. In this paper, the default value of 0.8 is selected as the consistency threshold, and the frequency threshold is the default value 1.

The results of the sufficiency analysis are shown in Table 5. There are six configurations of high performance. The coverage is 0.448, which indicates that

Table 4. Results of necessity analysis.

	consistency	coverage
Age	0.4792	0.4968
~Age	0.6108	0.6332
Gen	0.5384	0.5745
~Gen	0.5399	0.5442
Ten	0.5400	0.5583
~Ten	0.5550	0.5770
Soc	0.4962	0.5315
~Soc	0.5960	0.5986
Exp	0.5367	0.5520
~Exp	0.5579	0.5830
ESG	0.6743	0.6854
~ESG	0.4318	0.4567

Table 5. Configurations of antecedent conditions for high corporate performance.

	C1	C2	C3	C4	C5	C6
Age		⊗	⊗	⊗	●	⊗
Gen	⊗	⊗	●	⊗	⊗	●
Ten	⊗	⊗	⊗	●	●	●
Soc	⊗		●	⊗		
Exp		⊗		●	●	●
ESG	●	●	⊗		●	●
Raw coverage	0.212	0.148	0.120	0.101	0.081	0.095
Unique coverage	0.059	0.010	0.077	0.037	0.029	0.033
Consistency	0.817	0.850	0.834	0.783	0.846	0.852
Solutions coverage	0.448					
Solutions consistency	0.823					

Note: 1) "●" indicates that the condition occurs; 2) "⊗" indicates that the condition does not occur; 3) Blank indicates that the condition is irrelevant; 4) If font size is small, the antecedent is auxiliary; 5) If font size is large, the antecedent is nuclear.

these configurations explain 44.8% of the cases, and the consistency is 0.823, greater than 0.8, which indicates that these configurations are able to explain the driven paths of high performance better, and they have a strong explanatory power.

4.5. Driven Paths of High Corporate Performance

In this paper, these configurations are classified into three driven paths due to the difference between the presence or absence of antecedents.

1) ESG-driven path. The corresponding groupings for this path are C1 and C2. A low degree of Executive team heterogeneity and excellent ESG practice synergies with each other to improve corporate performance. The Executive team with low heterogeneity is closely connected, and its judgment and decision tends to be consistent. Thus, ESG is more easily integrated into development strategies. By conveying non-financial information about the corporate's good management, ESG can boost investors' confidence, broaden financing channels and alleviate financing constraints. On the other hand, ESG can help corporates attract talents, improve customer loyalty and avoid principal-agent problems. In summary, ESG can improve corporate performance.

2) Social interaction-path. This path is configuration C3. In this path, corporates with higher gender heterogeneity and social capital heterogeneity can effectively improve performance. Feminist care ethics suggests that a high proportion of female executives can help create better social and environmental benefits, improve corporate social responsibility fulfilment, and convey a good image of corporates. A high degree of social capital heterogeneity means that the social network constructed by the Executive team is extensive, which helps the corporate to obtain the corporate's scarce information and resources from the external environment. High gender heterogeneity and social capital heterogeneity promotes positive interaction between corporate and society, helping corporate to obtain legitimacy and heterogeneous resources.

3) Team conflict-driven path. The corresponding configurations are C4, C5 and C6. High tenure heterogeneity and high Occupational heterogeneity leads to high task conflict within Executive team. Conflicts arising from different perspectives and views on decision-making are conducive to shaping team's innovative atmosphere and stimulating creativity. At the same time, the group decision-making approach avoids major deviations caused by single decision-making. Therefore, it is conducive to improve corporate performance caused by high tenure heterogeneity and high Occupational heterogeneity.

5. Conclusion

Using 121 Chinese Shanghai and Shenzhen A-share pharmaceutical manufacturing corporates in 2021 as subjects, this paper uses fsQCA to explore the linkages and driven paths of Executive team heterogeneity and ESG on corporate performance. Among them, this paper classifies Executive team heterogeneity into five dimensions: age, gender, tenure, occupational background and social capital heterogeneity, and reveals the roles and complex interactions between the dimensions of Executive team heterogeneity and ESG in different driven paths in different contexts. This paper uses 121 A-share listed pharmaceutical manufacturing enterprises in 2021 as samples to explore the improvement path of pharmaceutical manufacturing enterprises' performance. It can guide Chinese pharmaceutical manufacturing enterprises to allocate talents for the executive team and help pharmaceutical manufacturing enterprises make ESG decisions.

The results of the study show that, firstly, the improvement of corporate performance does not depend on single factor of ESG or Executive team heterogeneity, but is the result of the synergistic effect of these factors. Secondly, through the sufficiency analysis, six configurations for high corporate performance were obtained, which can be summarised as "ESG-driven path", "social interaction-driven path" and "team conflict-driven path". Under the ESG-driven path, low Executive team heterogeneity is conducive to the formation of ESG decisions, and ESG practice helps corporates obtain legitimacy resources and investment advantages, thus improving corporate performance. Under the social interaction-driven path, the high proportion of female executives increases female perspective, and social capital heterogeneity strengthens corporate's social relationship network, which promotes the corporate's performance. Under the team conflict-driven path, high Occupational heterogeneity and tenure heterogeneity bring about a clash of ideas that can enhance the decision-making ability of executive team and improve corporate performance.

Based on the above findings, this paper makes the following recommendations: 1) In the process of selecting and training executives, corporates should take a holistic view, focus on diversified needs, pay attention to attracting members of different ages, genders and occupational backgrounds, and moreover, enrich all kinds of strategic talents. 2) Corporates should reasonably handle the relationship between Executive team members. 3) Corporates should practice ESG concepts, improve ESG standards and proactively disclose ESG reports to empower high-quality development.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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